

FED. ROAD DIST. NO.	STATE	FED. AID PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.	BR-HI-1(225)	2000	21	37

COLUMN RETROFIT NOTES:

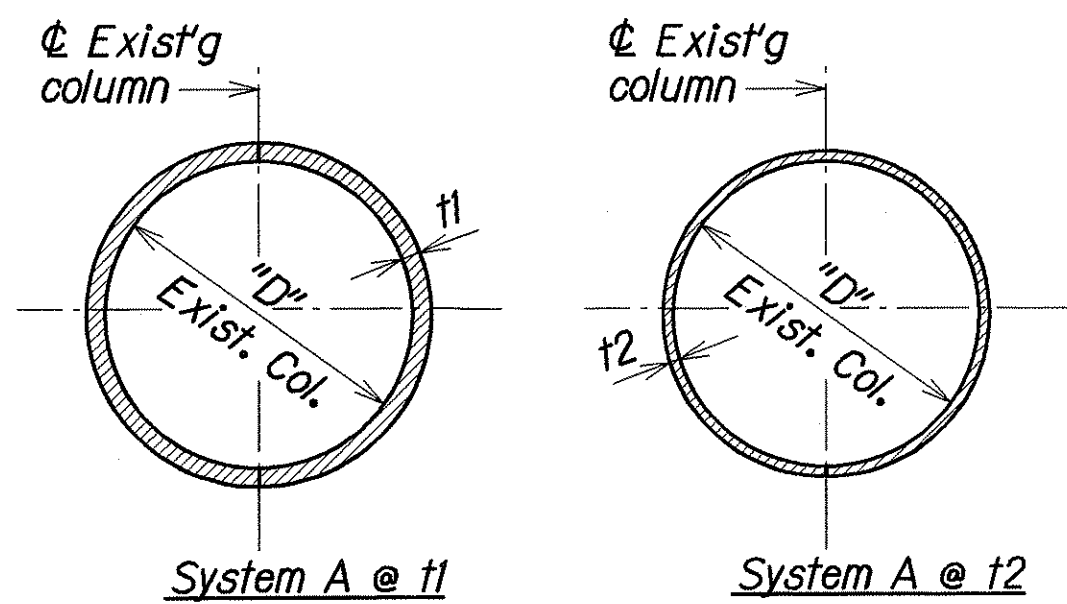
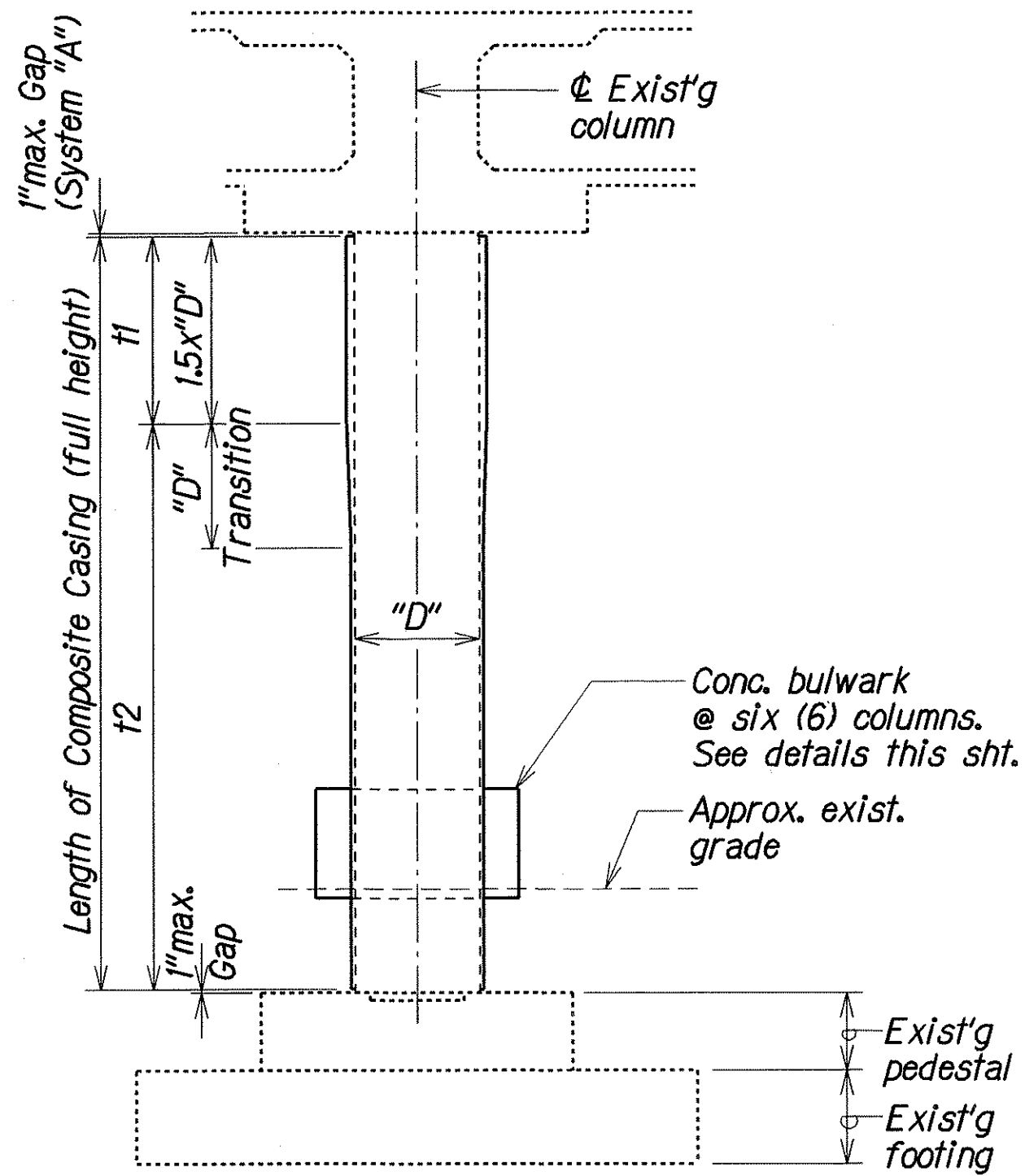
- General Notes:**
- For column heights less than 5 x "D", use constant thickness of "t1" for full height.
 - All cut edges shall be sealed with epoxy.
 - The casing thickness shall taper evenly the full length of the transition zone using epoxy.
 - All materials shall be protected from moisture.
 - Remove existing chain link fence adjacent to affected columns as required for Composite Column Retrofit. Contractor to restore chain link fence to original condition. Restoration work shall be considered incidental to Composite Column Casing and will not be paid for separately.

- System A Notes:**
- Each composite section shall be wrapped using continuous E-glass fabric not less than two (2) feet in height. All wraps of continuous E-glass weave shall be terminated at a minimum of 12 inches past the starting point of the initial wrap. Subsequent wraps shall be started (buffed) at the ending point of the last wrap.
 - The composite casing shall adhere firmly to all surfaces of the existing column.

- System B and C Notes:**
- Prefabricated shells shall be adhered to every surface of the column and adjacent shell with on-site mixed 2-part epoxy resin for System "B" and on-site mixed 2-part urethane resin for System "C".
 - Prefabricated composite shells shall be fitted to the column to accommodate super elevations.
 - All prefabricated composite shells shall be butted vertically.
 - Construction of the casing shall be such that all casing separations, interior and exterior of the casings, are filled with epoxy.

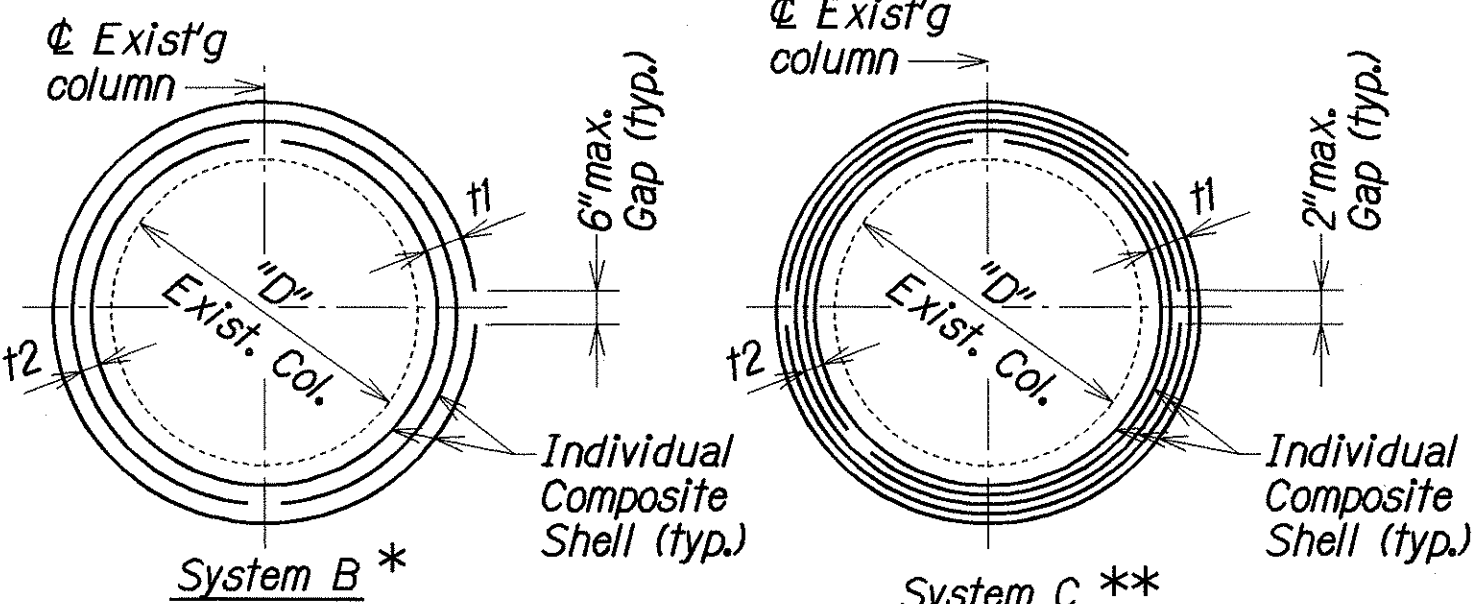
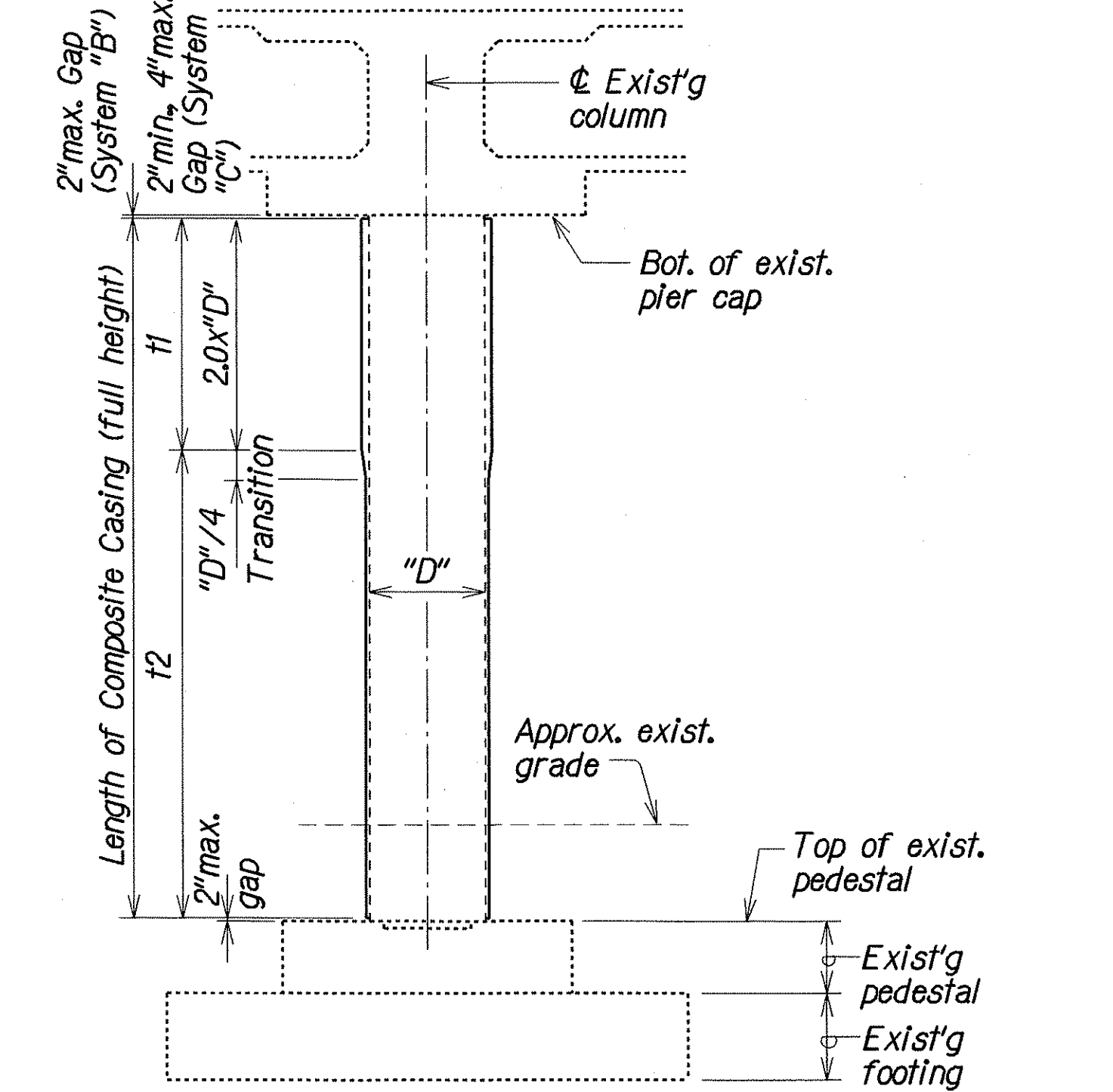
FOOTING RETROFIT NOTES:

- Drilling of holes, epoxy, dowels and roll roofing shall be incidental to Footing Retrofit.
- Demolish and remove existing concrete sidewalk, driveway, curb and gutter, and roadway pavement as required for Footing Retrofit. Contractor to restore concrete sidewalk, driveway, curb and gutter, roadway pavement and pavement markers to original condition. Restoration work shall be considered incidental to Footing Retrofit and will not be paid for separately.
- Clean top of existing pedestal and coat interface with epoxy bonding agent.



TYPICAL SECTIONS

System A Fiber Volume = 35%min. E-GLASS		
Round Column Diameter	Min. Thickness Accumulated Dry E-Glass	
	t1	t2
48"	0.65"	0.35"



TYPICAL SECTIONS

System B Fiber Volume = 45%min. EPOXY VINYLESTER RESIN E-GLASS			
Round Column Diameter	Individual Shell Thickness	No. of Shells	
	t1	t2	
48"	0.20"	3	2

System C Fiber Volume = 45%min. COMPOSITE SHELL			
Round Column Diameter	Individual Shell Thickness	No. of Shells	
	t1	t2	
48"	0.10"	5	3

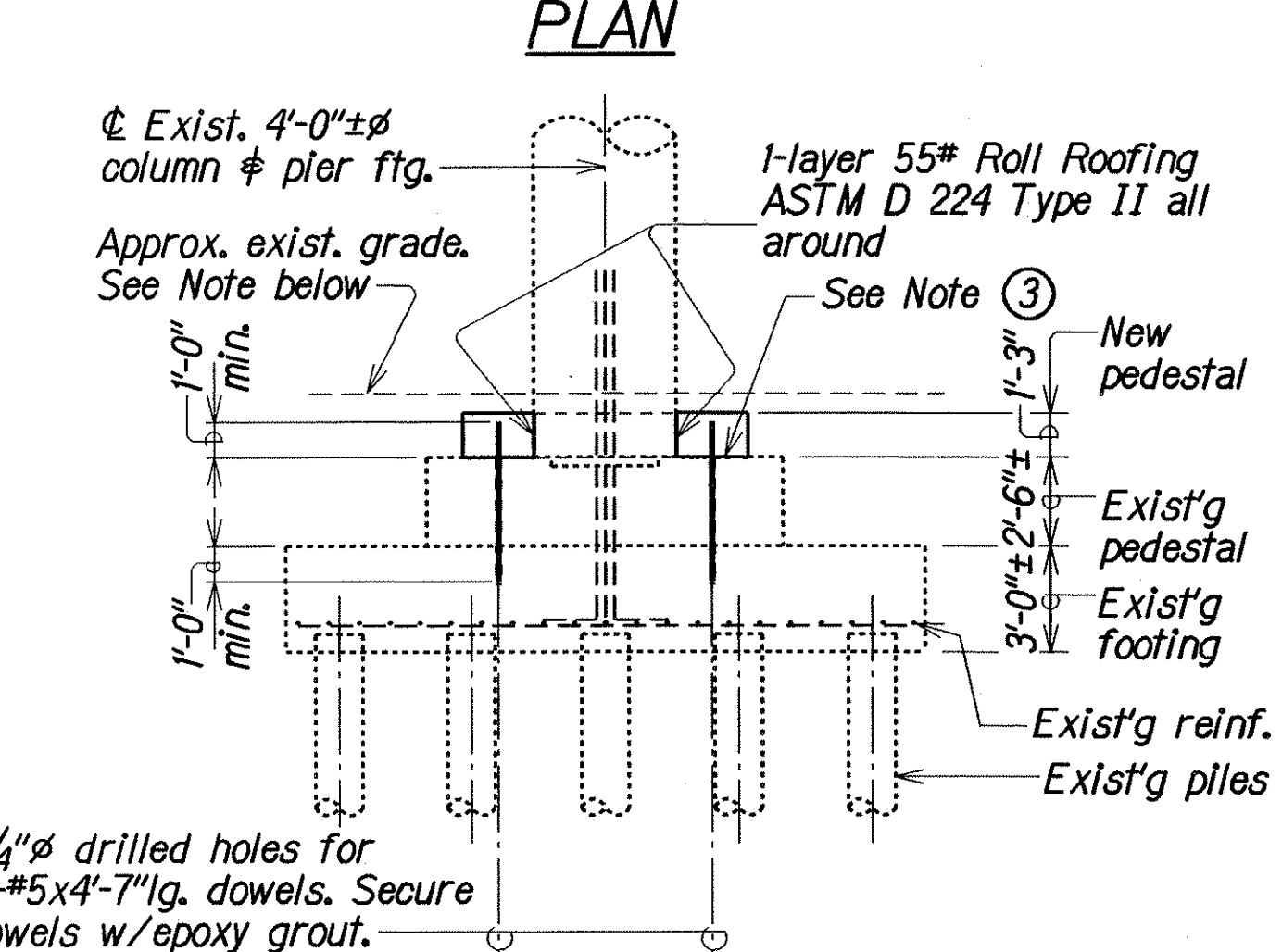
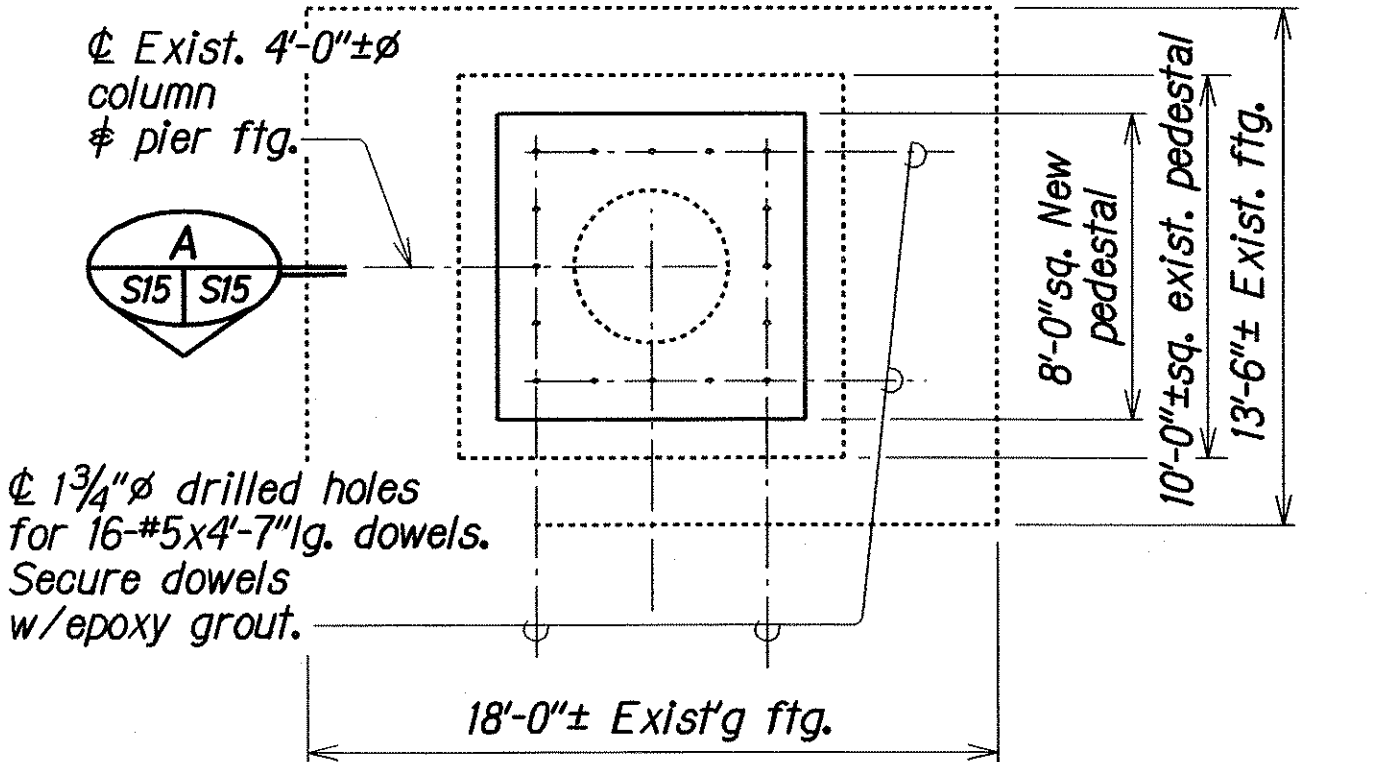
COLUMN HEIGHTS FOR COMPOSITE COLUMN CASING (in feet) **										
PIER	1	3	4	5	6	7	8	10	11	12
* Left	19.19	28.82	28.89	24.59	25.92	23.48	24.81	30.69	29.46	29.37
Right	20.49	30.62	30.51	26.14	27.17	21.94	23.15	29.08	27.76	27.77

* Left and Right columns are referenced based on increasing stations.
 ** Column heights shown are the clear distances from the top of footings or pedestals to the bottom of the pier caps.

COMPOSITE COLUMN RETROFIT

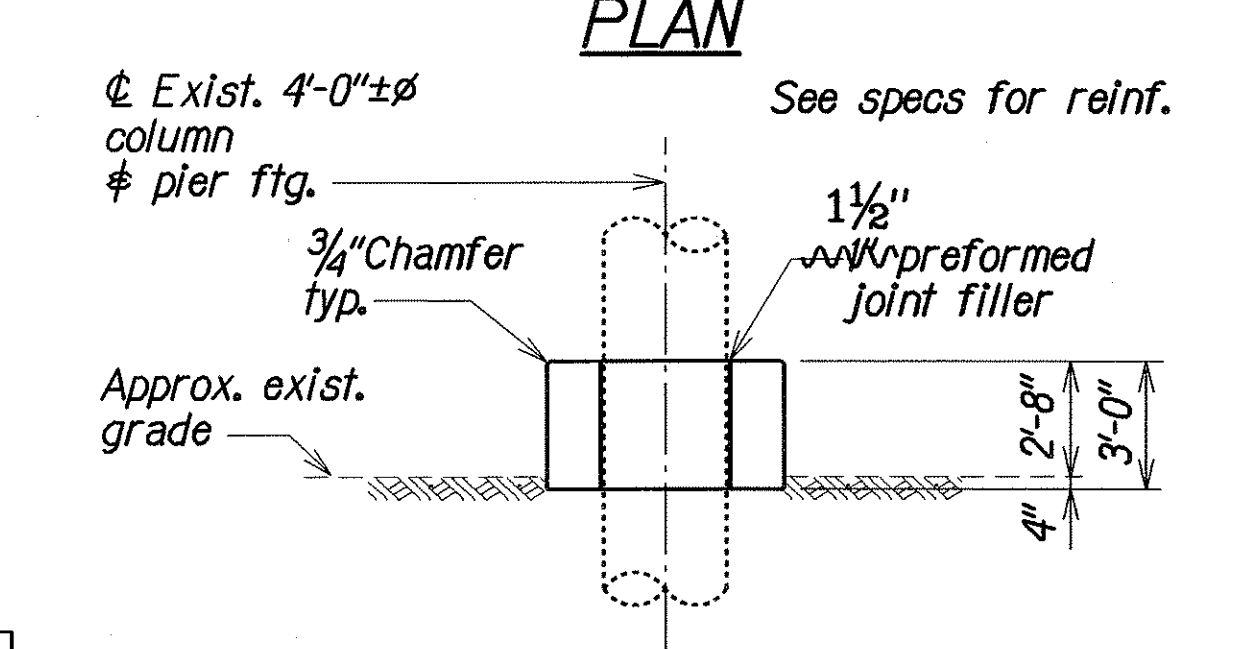
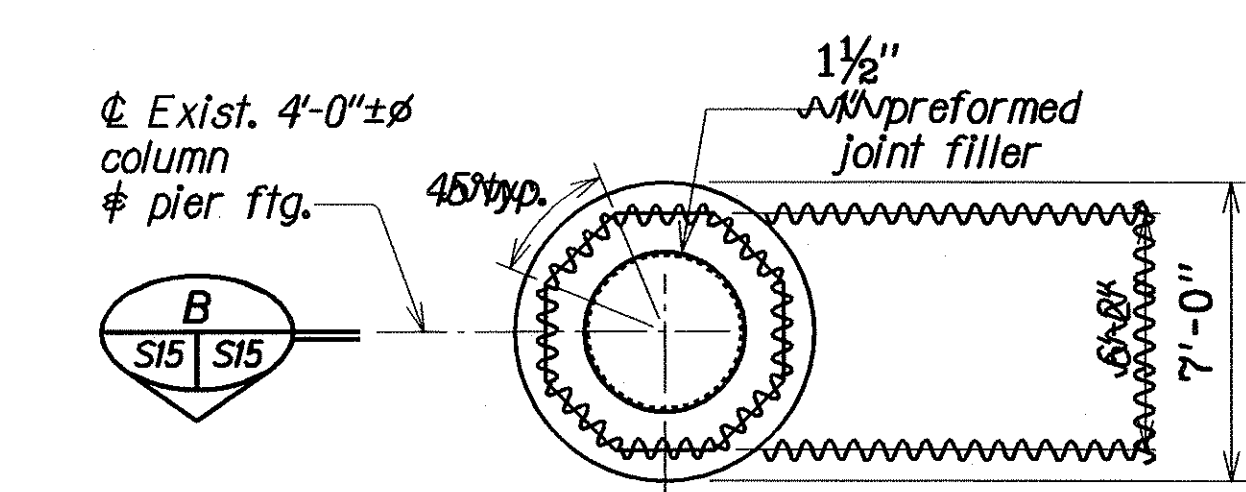
Not to Scale

LEGEND FOR AS-BUILT POSTINGS	
~~~~~	Squiggly line for as-built deletion
=====	Double line for as-built deletion
Roadway	Text for as-built posting



### FOOTING RETROFIT

Not to Scale



### CONCRETE BULWARK DETAILS

Not to Scale

ORIGINAL	DATE	12/15/99
DESIGNED BY	SA	12/15/99
TRACED BY	SA	12/15/99
NOTE BOOK	SA	12/15/99
QUANTITIES BY	SA	12/15/99
APP. RETROFIT	SA	12/15/99

DATE	DESCRIPTION
	STATE OF HAWAII DEPARTMENT OF TRANSPORTATION HIGHWAYS DIVISION
	<b>PALAMA SEPARATION</b> <b>COMPOSITE COLUMN RETROFIT and</b> <b>CONCRETE FOOTING RETROFIT DETAILS</b> SEISMIC RETROFIT for LUNALILO-VINEYARD OFF-RAMP, MAKIKI VIADUCT and PALAMA SEPARATION Fed. Aid Proj. No. BR-HI-1(225)
Scale: As Noted	Date: July 1999
SHEET No. S15 OF 25 SHEETS	